

2005 Progress Report of Activities

April 2006

USDA-NRCS Brooksville, Florida Plant Materials Center

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Conservation Concerns:

- Improve and Maintain Water Quality
- Control Erosion on Cropland and Stabilize Critical Areas
- Improve Forage on Pastures and Rangeland
- Improve Wildlife Habitat

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Mission and Objectives

The Brooksville, Florida Plant Materials Center (PMC) is operated by the USDA, Natural Resources Conservation Service. The mission of the Plant Materials Program is to deliver effective state-of-the-art plant science technology to meet the nation's natural resources conservation needs. To this end, we identify superior accessions of adapted plants which are then tested and released for production by commercial growers. We also provide technical assistance in plant

production and management methodologies. The evaluation and use of native plant materials is emphasized.

The major conservation objectives we address at the PMC are:

- Improve and maintain water quality
- Control erosion on cropland and stabilize critical areas
- Improve forage on pastures and rangeland
- Improve wildlife habitat

About the Brooksville, FL PMC

The PMC is located 7 miles north of Brooksville on U.S Highway 41, 15 miles inland from the Gulf of Mexico. Our service area includes all of Florida, Puerto Rico, and the coastal areas of Georgia, South Carolina, and Alabama (below).

There are 43 acres under cultivation, which are used for the evaluation and

production of plant materials. The remaining 139 acres of the property are native woodlands and planted pines. Structures include an office building and conference building, two greenhouses, a seed processing building, a laboratory for seed germination and tissue grinding, and an open educational shelter. Wildlife, such as deer and wild turkey, is abundant in the wooded areas and can be seen along the trails or around the edge of the fields.

PMC Service Area



New Switchgrass Cultivar Development



Our three switchgrass (*Panicum virgatum*) releases, Miami, Stuart, and Wabasso are all poor seed producers under Florida conditions. For this reason, they were all released as vegetative material. None of these possess attributes that would qualify them for widespread planting in the landscape as ornamentals. There is little economic justification for vegetatively planting them in pastures (NRCS 512), rangelands (550), and critical areas (342). As a consequence, their use has been limited. The need to develop a seed-propagated switchgrass for use in Florida has led the PMC to carry out additional collections of switchgrass within the state. We collected seed from 101 sites, grew them in the

greenhouse and planted them in the field in 2001, along with the three releases mentioned previously.

Switchgrass is naturally polyploid (more than two sets of chromosomes) and has two basic functional types, upland and lowland ecotypes, that are better adapted to drier and wetter sites, respectively. Upland types are shorter than lowland ones and are often fairly rhizomatous; they are usually hexaploid (six sets of chromosomes) or octoploid (eight sets). Upland types are taller, with a strongly clump-type growth form and are generally tetraploid (four sets of chromosomes). Crossing switchgrass plants with different ploidy levels will lead to sterile offspring. You cannot just look at a switchgrass plant and determine its ploidy level, this has to be determined from tissue samples in the laboratory. PMC personnel and Mimi Williams, the Florida Plant Materials Specialist, are cooperating with Ken Quesenberry, Professor of Agronomy at the University of Florida, to conduct this research. Samples were taken in July of 2005, but the chromosome counts on some accessions were not conclusive. These plants will be re-sampled in 2006 and then we can proceed with grouping plants with like ploidy levels in crossing blocks to develop improved switchgrass selections for Florida.

Ghost Rider Purple Bluestem

Documentation was completed in 2005 to release a selected chalky bluestem (*Andropogon virginicus* var. *glaucus*) for use in Florida's reclaimed (543, 544) and critically eroding (342) areas and pasture (512) and rangelands (550) to provide wildlife habitat, species diversity, and forage. However, we ran into a slight setback that has delayed completion of the release. The plant sample we submitted for identification turned out to be purple (*Andropogon glomeratus* var. *glaucopsis*), not chalky bluestem. Both species characteristically have a powdery, chalky covering on the foliage; however, purple is the more vigorous growing of the two. Since the accession we are releasing consists of an assembly of ten different accessions collected in Florida, we needed to be certain that all were indeed purple bluestem. Seeds from the original collections will be grown out and the seedlings identified in 2006. Then, the release of Ghost Rider can be completed and seed can be distributed to producers.



Other Pending Plant Releases



When the PMC collected plants of hairawn muhlygrass (*Muhlenbergia capillaris*) in the 1990s, one of the accessions collected in Citrus County had white flowers (above) instead of the normal reddish purple-colored ones. This flower coloration lasted throughout the season and when seedlings were grown from the seed of these plants, they also flowered white. This as yet unnamed selection will be released in 2006 for use as an ornamental. Although the seed is “true” to the parent plant, this accession will be maintained in the nursery trade in a vegetative form.

Lopsided Indiangrass Development

The PMC is working to evaluate, develop, and release a native Florida variety of lopsided indiagrass (*Sorghastrum secundum*) for conservation use, especially for erosion control (342, 391), native area restoration (327, 562), and wildlife cover (392, 645). Lopsided indiagrass differs from yellow indiagrass in having spikelets that all hang to the same side of the panicle. Both species occur in Florida, but yellow is found mainly in the northern part of the state and lopsided is most common in the central and southern sections, although it can be found throughout the state. There are currently two crossing blocks at the PMC: one consists of three accessions that are all stiff and upright, with a bluish coloration to the foliage, and the other includes plants from 21 superior accessions collected in peninsular Florida.

We have experienced problems with stand persistence in production fields at the PMC. Whether this problems is due to biotic (insect or disease) or abiotic factors

We also have a vigorous blue maidencane (*Amphicarpum muehlenbergianum*) selection that we will increase in 2006 (below). Although not related taxonomically, it is similar in appearance and usage to Citrus maidencane, which we released in 1998. It is shorter growing than Citrus and has bluish foliage with a reddish to white margin. It is also highly rhizomatous and can quickly fill in an area after planting. Blue maidencane produces sterile seedheads above ground. Fertile flowers and seed are produced on a short below-ground stem, which is why this plant got its other common name of goober grass. Harvesting seed is impractical so it must be planted vegetatively. It can be used in restored (657) or constructed wetlands (656) or aquaculture ponds (399) for bank stabilization, nutrient uptake (590), and wildlife food and cover (644).



(irrigation, residue buildup, nutrient deficiency) has not been completely determined. To address this problem, the PMC also is conducting research on residue management to improve stands of the blue-foliaged selections of lopsided indiagrass. Treatments we are using are burning and clipping during the late winter and a summer clipping treatment compared to a control that is neither burned nor clipped.



Eastern Gamagrass Seed Production Management

Eastern gamagrass (*Tripsacum dactyloides*) is a large, native, bunch grass that is well adapted for erosion control (386, 601) and pasture and range plantings (512, 550). Its high palatability for livestock and great potential to address many conservation concerns has created a lot of interest in this species from PMCs located in the eastern half of the US where eastern gamagrass is native. None of the seed sources that can be purchased commercially are well suited for use in Florida. We have selected an eastern gamagrass that was collected in Polk County for increase and release. This accession performs well in Florida, but is poorly adapted to areas with colder winters. We plan to release this eastern gamagrass selection as soon as we are able to produce sufficient seed to supply potential seed producers.

Eastern gamagrass plants are notoriously poor seed producers. In order to maximize seed production, we initiated a study to look at the effect of row spacing and fertility on seed production of our selected eastern gamagrass accession (right). Row widths were 2-, 4-, 6-, and

8-foot with a 3-foot spacing between plants in the rows. Fertility treatments consisted of 0, 50, 100, and 200 pounds of nitrogen per acre applied as 10-10-10 in the spring of the year. Numbers of fertile shoots per plant, yields, and seed germination percentages will be determined for each treatment. Once the optimum plant spacing and fertility levels have been determined, this information will be incorporated in planting guides for our future release.



New Phlox Flower Shapes

Annual phlox (*Phlox drummondii*) is a wildflower that is well adapted for use along the roadsides in Florida to provide color in the early spring. Seeds of annual phlox are small and there are glandular hairs around the seed capsules that makes harvesting a challenge. Steve Melton of Jack Melton Family, Inc., is one of the seed producers in the state that is interested in growing annual phlox for the Florida Department of Transportation. In 2001, Mr. Melton located the field pictured below near Trilby. It was an old hayfield that the owner had disked in preparation for rejuvenation. A solid stand of annual phlox germinated in response to this treatment. He consulted with the staff at the PMC to determine how to harvest this seed.



In this stand of annual phlox, there were several plants that had unique star-shaped corollas (below). The PMC obtained seed from these plants and we are selecting for



this flower characteristic. We feel that if we can stabilize this trait in the population that we would create a new annual phlox seed source that would have improved potential for use along the roadsides in Florida.

Security Upgrades

In the last five years, security of government facilities has become a major national concern. During this time, the PMC has made significant strides in improving its security measures. The PMC boasts a chain-link fence with a controlled access gate around the main compound. Security alarms were installed in the buildings and funds were set aside in 2005 to install a generator to allow us function and to act as the State Office emergency location in the event of outages. We also received funding in 2005 to install a barbed-wire fence around the perimeter of the entire property (pictured), install a duress (panic) alarm in the chemical building, replace the door to the fertilizer storage area, and install burglar bars on the windows to the shop, seed cleaning building, and over a vent in the chemical building. These were the items that were identified as being defi-

cient at the PMC during a security assessment conducted in 2003. With completion of these remaining items, the Florida PMC is setting the standard for PMCs nationwide in addressing security issues.



PMC Tours and Trade Shows

One of the responsibilities of the PMC is to get the word out about who we are, what we do, and what we can offer to landowners and producers. To fulfill this function, the PMC attends meetings, trade shows, and provides tours of our facilities, and training on plant materials topics to various groups. These pictures illustrate some of the PMC outreach activities for 2005.



Booth at Florida Nursery and Allied Trade



Plant Materials Training for NRCS Student Intern Abdul Mohammed

Others include:

- PMC tour for personnel from Ernst Conservation Seeds
- Booth at Tampa Bay Wholesale Growers Expo
- PMC Tour for Master Gardeners from Marion County, Florida

PMC Information Is Available Online At:
<http://www.fl.nrcs.usda.gov/programs/flplantmaterials.html>
 or
<http://plant-materials.nrcs.usda.gov>

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